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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/380,563 09/03/99 SHOZAKAI

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EXAMINER

WM02/1003

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ARMSTRONG, A

ART UNIT

PAPER NUMBER

2641

DATE MAILED:

10/03/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/380,563

Applicant(s)

SHOZAKAI ET AL.

Examiner

Angela A. Armstrong

Art Unit

2641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Furukawa et al (US Patent No. 5,463,618).
4. Regarding claims 1-3 and 7-9, Furukawa et al discloses an echo canceller with Normalized Least Mean Square algorithm and teaches

Determining a pseudo acoustic signal at col. 6, lines 14-21

Providing for holding signals at col. 6, lines 17-18

Subtraction of the acoustic echo signal at col. 6, lines 21-26

Updating at col. 6, lines 37-40

Voice detection at col. 7, lines 40-55

Holding response as determined by voice detection results at col. 7, line 63 – col. 8, line 53

Double Talk Detection (speech recognition) at Figure 1, element 9.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-5 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al in view of Rahim et al (“Signal Conditioning Techniques for Robust Speech Recognition”, 1996).

7. Regarding claims 4-5 and 10-11, Furukawa et al do not teach cepstral mean subtraction. Refer to Rahim et al, who teach a speech recognition system with signal enhancement which implements a cepstral mean subtraction algorithm via determining the cepstrum, calculating the average cepstrum and subtracting the average cepstrum from the cepstrum. Rahim et al teach that cepstral mean subtraction is widely used in speech recognition (page 107, col. 1, section II) and that it improves the robustness in speech recognition by minimizing distortion on the input signal to the recognizer (page 107, col. 1, section I).

8. Therefore, it would have been obvious to one of ordinary skill at the time of invention to modify the system of Furukawa et al, and implement a cepstral mean subtraction algorithm as

taught by Rahim et al , for the purpose of improving the robustness in the speech recognizer, as suggested by Rahim et al.

9. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rahim et al, ("Signal Conditioning Techniques for Robust Speech Recognition", 1996).

10. Regarding claims 6 and 12, Rahim et al teach determining the cepstrum, calculating the average cepstrum and subtracting the average cepstrum from the cepstrum. However, Rahim et al do not specifically teach implementing cepstral mean subtraction (CMS) on a non-speech cepstrum. However, it would have been obvious to one of ordinary skill at the time of invention to use a CMS algorithm on a speech cepstrum and a non-speech cepstrum to provide an accurate estimate of other sounds or noise, so as to provide more efficient signal enhancement of the input signal to the speech recognizer.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Takagi (US Patent No. 5,655,057) teach a speech recognition apparatus which implements signal enhancement via spectral subtraction.

13. Picone et al, 1988, "Enhancing the Performance of Speech Recognition with Echo Cancellation", Acoustics, Speech, and Signal Processing, ICASSP-88., 1988 International Conference on, Page(s): 529 -532 vol.1

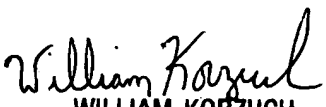
14. Gupta et al, "High Accuracy Connected Digit Recognition for Mobile Applications", Acoustics, Speech and Signal Processing, 1996. ICASSP-96, Conference Proc 1996 IEEE International Conference on, Vol. 1, pages 57-60.
15. Flores et al, "Continuous Speech Recognition in Noise Using Spectral Subtraction Adaptation", Acoustics, Speech, and Signal Processing, 1994, ICASSP-94. 1994 IEEE Int. Conference on, Vol. 1, pages I/409-I/412.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on 703-305-6137. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-6306 for regular communications and 703-308-6296 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

AAA
September 30, 2001


WILLIAM KORZUCH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800